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10/637,088	08/05/2003	Joseph E. Herceg	S-100,120	9081

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UNITED STATES DEPARTMENT OF ENERGY  
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WASHINGTON, DC 20585-0162

EXAMINER

WILKINS III, HARRY D

ART UNIT PAPER NUMBER

1742

DATE MAILED: 11/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/637,088

Applicant(s)

HERCEG ET AL.

Examiner

Harry D. Wilkins, III

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 1-8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9 and 11-19 is/are rejected.
- 7) ☒ Claim(s) 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11/21/03.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-8, drawn to an electrolytic process, classified in class 205, subclass 47.
- II. Claims 9-19, drawn to an electrolytic apparatus, classified in class 204, subclass 201.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus as claimed can be used to practice a different process, such as the electrorefining of copper.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Joy Alwan on 28 October 2005 a provisional election was made with traverse to prosecute the invention of group II, claims 9-19. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-8 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

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5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Means-Plus-Function Language***

6. Instant claims 9 and 13 contain the following terms written in means-plus-function format, and have been interpreted as follows:

1. "means for oxidizing the uranium and other metals" is in proper means-plus-function format but is not specifically described in the specification. It is interpreted to mean any device which causes the oxidation of a material.

2. "means for continuously transporting spent metallic nuclear fuel to the oxidizing means" is in proper means-plus-function format but is not specifically described in the specification. It is interpreted to mean any device for continuously feeding the material to the anode.

3. "means for reducing uranium (III),  $U^{+3}$ , ions while keeping the other metals oxidized" is in proper means-plus-function format but is not specifically described in the specification. It is interpreted to mean any device upon which the material is reduced (i.e.-deposited).

4. "means for isolating the reduced uranium from the other metals" is in proper means-plus-function format but is not specifically described in the specification. It is interpreted to mean any device for removing the deposited material.

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5. "means for receiving inert material remaining after the oxidation and reduction" is in proper means-plus-function format but is not specifically described in the specification. It is interpreted to mean any device that accumulates material transported by the means for continuously transporting that is not reacted.

6. "means for cleaning the transport means, comprising a second salt bath adapted to receive the segmented chain belt" is recited in proper means-plus-function language, however, the structure of the means is defined in the claim as being a second salt bath adapted to receive the segmented chain belt.

#### ***Claim Interpretation***

7. The present claims have specific recitations of spent nuclear fuels and uranium. However, the present claims are apparatus claims. Hence, any device which teaches all of the structural limitations of the claim anticipates the claim. See MPEP 2114 and 2115. The intended use of the claimed structure is not given patentable weight.

#### ***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claim 9 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the disclosed structure (see, e.g.-figure 2), does not reasonably provide enablement for each and every structure covered by the laundry list of means-plus-function limitations. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make

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the invention commensurate in scope with these claims. The specification does not provide enablement for a means for oxidizing the uranium not comprising an anode, such as sodium hydroxide.

10. Claim 11 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. An electrolytic salt bath, i.e.-the electrolyte, cannot be considered part of the anode of the system. An electrolytic system includes three essential parts, the anode, the cathode and the electrolyte which separates the anode from the cathode. As such, the electrolyte cannot be considered to be part of the anode. This claim will be interpreted to mean that the anode included the containment vessel and the transport means.

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 12 recites the limitation "the segmented chain belt" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim. It appears that this claim should depend from claim 10, which gives antecedent basis for the segmented chain belt. Examination will be based upon the assumption that claim 13 depends from claim 10.

***Claim Rejections - 35 USC § 102***

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claims 9 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Leeker et al (US 5,106,467).

Leeker et al anticipate the invention as claimed. Leeker et al teach (see figures 1-3 and col. 4, line 17 to col. 7, line 30) a device including a means for oxidizing a metal (zinc) from scrap material including a tank and an oxidizing agent (sodium hydroxide), a means for continuously transporting (conveyor belt and baskets) the scrap material to the oxidizing means, a means for reducing the metal (cathodes 52), means for isolating the metal (see col. 6, lines 2-3) including removing the metal from the cathode and, although not explicitly disclosed, a means for receiving the scrap material not oxidized in the tanks.

Regarding claim 12, the means for reducing the metal was a cathode.

15. Claims 9 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Fraser et al (US 4,204,922).

Fraser et al anticipate the invention as claimed. Fraser et al teach (see figures 1, 2 and 4, abstract and related descriptions) a device for metal recovery including means for oxidizing the metal (anode), means for continuously feeding the metal containing material (particulate sulphide material) to the anode, means for reducing the metal ions

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(cathode), means for isolating the reduced metal (recovering metal values from the cathode) and inherently a means for receiving inert material remaining after the oxidation.

Regarding claim 12, the device of Fraser et al included a cathode for reducing the metal ions.

***Claim Rejections - 35 USC § 103***

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 14, 17, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leeker et al (US 5,106,467) OR Fraser et al (US 4,204,922).

Regarding claim 14, although Leeker et al and Fraser et al are silent as to how to remove the deposited metal from the cathode, a conventional scraping blade located away from the electrolyte for scraping the deposited metal from the cathode would have been used because the blade would easily separate the deposited metal from the metal of the cathode.

Regarding claim 18, it would have been obvious to one of ordinary skill in the art to have used a hard material for the scraping blade to increase its lifetime, such as silicon carbide.



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Regarding claim 17, it would have been obvious to one of ordinary skill in the art to have made the device from a suitable material that would be resistant to the materials which were placed in the device, such as stainless steel.

Regarding claim 19, it would have been obvious to one of ordinary skill in the art to have made the device from materials with melting points above the treatment temperature in order to avoid the device failing during use.

18. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fraser et al (US 4,204,922).

Fraser et al teach stationary anodes and cathodes. However, it would have been obvious to one of ordinary skill in the art to have made the anodes and cathodes of Fraser et al be rotatable around the central axis in order to exert a stirring force on the electrolyte, thereby negating the need for the stirring means of Fraser et al. The anodes and cathodes would have been moved simultaneously. It would have been within the expected skill of a routineer in the art to rotate the anodes and cathodes in opposite directions to create stronger stirring forces.

19. Claims 9, 12 and 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al (JP 10-053888).

Tanaka et al teach (see English abstract and figures 1 and 2) a device including means for oxidizing uranium, means for reducing the uranium ions, means for isolating the deposited uranium and means for feeding spent nuclear fuel and receiving the inert material after the oxidation and reduction (basket).

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Thus, the difference between the disclosure of Tanaka et al and the claimed apparatus is that Tanaka et al disclose a batch type device where the transporting means does not operate continuously.

However, it would have been obvious to one of ordinary skill in the art to have adapted the apparatus of Tanaka et al to operate with a continuous fuel feed.

Regarding claim 12, the device of Tanaka et al included a cathode for reducing the metal ions.

Regarding claims 15 and 16, Tanaka et al teach stationary anodes and rotary cathodes. However, it would have been obvious to one of ordinary skill in the art to have made the anodes of Tanaka et al be rotatable around the central axis in order to exert a stirring force on the electrolyte. The anodes and cathodes would have been moved simultaneously. It would have been within the expected skill of a routineer in the art to rotate the anodes and cathodes in opposite directions to create stronger stirring forces.

Regarding claim 14, Tanaka et al teach a conventional scraping blade 6 located away from the electrolyte for scraping the deposited metal from the cathode.

Regarding claim 18, it would have been obvious to one of ordinary skill in the art to have used a hard material for the scraping blade to increase its lifetime, such as silicon carbide.

Regarding claim 17, it would have been obvious to one of ordinary skill in the art to have made the device from a suitable material that would be resistant to the materials which were placed in the device, such as stainless steel.

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Regarding claim 19, it would have been obvious to one of ordinary skill in the art to have made the device from materials with melting points above the treatment temperature in order to avoid the device failing during use.

***Allowable Subject Matter***

20. Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

21. Claims 11 and 13 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 1<sup>st</sup> and 2<sup>nd</sup> paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

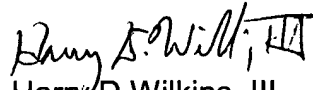
***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D. Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Harry D Wilkins, III  
Examiner  
Art Unit 1742

hdw